

Dvorak Developments

Dvorak Developments #45 (Volume 13, Number 3) — Spring 1986

New Line of Dvorak Typewriters to be Announced

Several model lines of Silver Reed typewriters will have Dvorak keyboards available as an option, according to a Silver Reed vice president. The machines will be introduced later in the year, and will join one existing Silver Reed typewriter that already has a Dvorak option available.

"One family of machines, possibly two or three, will have Dvorak available," said **Smokey Umeda**, Assistant Vice President in charge of service and technical design at Silver Reed. The first family of typewriters will be announced later this year, and as many as two other families with Dvorak will be announced at the end 1986 or the beginning of 1987.

Silver Reed has one typewriter available now with an optional Dvorak layout. "We already have Dvorak available on our EX-55," Umeda said. The EX-55 is a daisy wheel electronic office type-

'One family of machines, possibly two or three, will have Dvorak available'

writer. The machine has been on the market for about four years, and the Dvorak option on it has been available for about one year. "Unfortunately, it (the Dvorak option) has not been widely publicized," he said.

The new typewriters to be announced likely will have Dvorak as a factory option, rather than be switchable between Qwerty and Dvorak. "Electronically, it can be switchable," Umeda said. But because it would increase the cost of the machine and because keyboard translation might slow down the operation of the typewriter, Silver Reed probably won't introduce a switchable keyboard. "Since the Dvorak will speed the throughput — typing speed — you must have a quick reacting machine to get the full benefit of the Dvorak," he said. The new machines will be able to print approximately 20 characters per second.

The machines' Dvorak keyboards will follow the ANSI standard Dvorak layout. Umeda said the Dvorak option probably will not cost extra.

Controversy over Finger Travel

by Randy Cassingham

In the February issue of *Byte* magazine, there is an article about the Dvorak keyboard. The article is quite favorable toward Dvorak, but the authors question the often-quoted finger travel figures. The authors refer to such claims as a Qwerty typist's fingers travel 12-20 miles in a day of typing versus around one mile of travel for a Dvorak typist working on the same material. Many authors have averaged this figure to make a ratio of 16 to 1.

The conclusion the *Byte* authors made is that the actual ratio is more like 1.39 to 1, (that is, Qwerty finger travel is about 39 percent more than Dvorak finger travel) — quite a different figure. How could such a difference be accounted for?

Dvorak Developments contacted one of the foremost experts on English language keyboard research, Professor **Hisao Yamada** of the University of Tokyo, to ask his impression of the *Byte* article's conclusion. Yamada advised that there are several factors that in-

Are We Becoming Too Efficient?

by Virginia Russell

President, Dvorak International Federation

Increased efficiency in the office has created a problem which has surprised the medical profession and ergonomists.

Tenosynovitis, a painful inflammation of the sheath connecting the tendons in the arm, wrist, and fingers, occurs as a result of repetitive strain injuries (RSI), which includes carpal tunnel syndrome (nerve compression at the wrists), the well-known tennis elbow, and non-specific aching in the forearm muscles, wrist, and finger joints.

According to the Health Department in New Zealand, where the affliction is being studied, anyone over-using their muscles or tendons while doing a lot of repetitive motions is prone to RSI.

Margaret Gilbert, a thirty-year-old New Zealand word processing worker, was pleased with her fast electronic keyboard. She had never typed faster — she became a whiz word processor until one day she began to feel a small pain in one finger. Within 24 hours there was no movement in any of her fingers. Her hands turned blue and cold, and developed lumps. The pain became unbearable.

After 12 years her job was over. Nine months later, Margaret Gilbert still cannot move her hands. She is hampered from using the everyday hand motions we find so simple. The fluid in the sheaths in her hands dried up. This affliction is a result of repetitive typing on an electronic keyboard. She was able to type so much faster on the "soft" board that her body could not handle the speed. On an electronic keyboard, speeds can be achieved which were not possible on the electric typewriter. Typists using electronic keyboards are producing so many keystrokes that they are overabusing their bodies. Reduction of finger movement is necessary to prevent the occurrence of RSI.

Anne Else, a freelance writer, began to feel pain in her wrists after a month on her computer. Rest and wearing gloves to keep her hands warm while she typed cleared up the problem. Anne checked the latest ergonomic research, lowered her keyboard so her arms were vertical and the keyboard horizontal. Anne sidestepped the problem; Margaret was not so lucky.

Tenosynovitis became so bad in the Australian parliamentary counsel office that word processors were exchanged for electric typewriters.

Does the Dvorak keyboard help prevent tenosynovitis? We think it will, but will make no conclusions until we have researched. Dvorak keyboard operators are being watched very carefully. Through micromotion camera studies, the Denenberg studies and actual on site testing we have concluded there is a lessening of hand and finger motion by the Dvorak typist. If less motion and less hurdling around the keyboard can help prevent tenosynovitis, a serious threat to typists using electronic keyboards will be avoided. With 70% of the workload being on the home row of the Dvorak, logic indicates the threat of RSI is not as great with the Dvorak keyboard as with Qwerty. But we are not making any assumptions, we are researching this affliction in detail. When DIF has completed the research with the New Zealanders and the Australians, we will make a follow-up report.

(Editor's note: for more information on RSI and the DIF research project, contact DIF directly: DIF, PO Box 128, Brandon VT 05733, (802) 247-6020.)

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Letters

Thank you, Mrs. Dvorak

Dvorak Developments brings good news about the Simplified Typewriter Keyboard, surely resulting from your energized efforts. As you know, all we need is to have a well known organization take the lead in shifting to the Simplified Keyboard. Obviously, for better or for worse, nothing is better known than "IRS" (see *IRS Action Could Save Millions*, Winter 1985).

My attention is attracted especially to the article about the Smithsonian Institution, with its well established Typewriter section. After 54 years since its patented introduction in the U.S. I am glad there is a request for one of the early Simplified Keyboard typewriters.

August had S.K. student typists trained in Tacoma, Wash. public schools. For nine years (1932-1941) he selected his best students, each year entering them in the International Commercial Schools Contests held annually in Chicago. Each student had his/her own typewriter. This was controlled competition with the best typists of all ages in America. Most of August's students were teenagers.

At the close of 1941 the contests were discontinued because of WWII. But, August always added "because they showed nothing but the superiority of the Simplified Keyboard." To substantiate this remark, refer to the book by W.C. Maxwell, *Typewriting Tests Book I*. (Educational Test Bureau, Educational Publishers Inc., 1950) In this book on pages 10, 26 and 32 are pictures of three simplified keyboard typists with listings of their outstanding achievements in the ICSC contests. (*Simplified keyboard typists' were awarded 1st, 2nd and 3rd places in 1933-1941. See pages 142 and 143 in the same book. Ed.*)

I anticipate reading your book, *The Dvorak Keyboard*. Best of wishes and courage for this New Year.

Hermione Dvorak
Seattle WA

Dvorak standard

I am a software professional, so typing has been one of those necessary skills that I have cultivated over the years. I started a literature search to find what I could on the Dvorak keyboard. To my consternation, I discovered that Dr. Dvorak's work does not cover the full printable ASCII (computer) character set as required by modern keyboards. Even worse, his pairing of certain letters between upper and lower case is not the same as on modern keyboards.

Imagine how I felt when I received **Dvorak Developments** and discovered a *seventh* layout for some of these keys. We really need a standard here. I saw a reference to "ANSI Dvorak" in your newsletter — is this real? What can I find out about it?

D. Jason Penney
Aloha OR

Yes, there is a standard. ANSI (the American National Standards Institute) accepted the Dvorak as the "alternate" to Qwerty in 1982. The diagrams found in Dvorak Developments follow that standard, known as ANSI X4.22-1983.

One of the reasons for making the standard was to include the characters found on modern — including computer — keyboards. There are blank keys included on the standard layouts to allow for computer and other graphic characters not normally found on typewriters. The key pairings on the standard match those found on the standard ANSI Qwerty layout.

Dvorak Developments believes that it is essential that Dvorak products follow the ANSI standard layout. Several variants will only slow the acceptance of Dvorak in the business and government worlds and make product compatibility difficult.

Qwerty is WHAT?

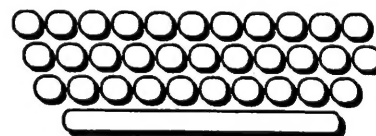
For the past three Decembers I have ruefully amused myself by visiting the IBM product Center on 5th Avenue, New York. There I ask politely, if disingenuously, if the company offers any keyboard products in the Dvorak or American Simplified Keyboard layout. Invariably my question is greeted with that stare of bored condescension reserved by a few Manhattan salespeople for the criminally insane, and the reply that nobody at IBM has ever heard of a Dvorak layout.

This year the well dressed young clerk actually added: "Qwerty is the American Simplified Keyboard." (To give him his due, before he pronounced this patriotic gem, it was necessary to explain to him that the term 'Qwerty' described all the keyboards lying about him in the store.)

I make no fuss at these annual rites, knowing well a DSK layout is available from IBM (on their Selectrics, at least) to anyone willing to special order it. It does strike me, however, that I should be delighted to have a sticker such as the one (**Dvorak Developments** uses) to place on envelopes addressed to IBM Staff Training Centers.

Christopher Ross
Victoria, BC Canada

Dvorak Developments has stickers that we place on the envelopes of outgoing mail. They read "I Type Dvorak — Ask Me About It."



Dvorak Developments

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Editor Randy Cassingham
Managing Editor Michele Wolf
Contributing Editors Phil Davis
..... Virginia Russell

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It's Here!

Just off the press, **The Dvorak Keyboard** is already getting raves from reviewers.

"This is one of the most fascinating books I've had the pleasure to read lately. Cassingham really did his research on this book. The detailed appendix with its listing of the many products available that support the keyboard is worth the price of the book in itself." — *Mark Nolan, Information Marketing newsletter*

"This book will help to answer the basic questions frequently asked about the Dvorak keyboard." — *Virginia Russell, President, Dvorak International Federation*

"This country needs many millions of these books. It ought to be required reading in high schools, colleges, and business and vocational schools." — *Belmont Adams, Scarborough, Maine*

The Dvorak Keyboard will answer your questions about the Dvorak, or we'll give you your money back.* Written by **Dvorak Developments** editor **Randy Cassingham**, the book includes:

- ✓ A clear explanation of the logical design and evolution of the Dvorak
- ✓ No nonsense information on how to convert
- ✓ Proof of Dvorak's superiority over Qwerty
- ✓ The many factors that allowed Qwerty to become entrenched as the 'standard' keyboard, and why it took until now for Dvorak to become popular
- ✓ A listing of the many products available to help you convert, including computer conversion programs, tutorials, and replacement keyboards
- ✓ Newly designed comparative diagrams of all the layouts discussed

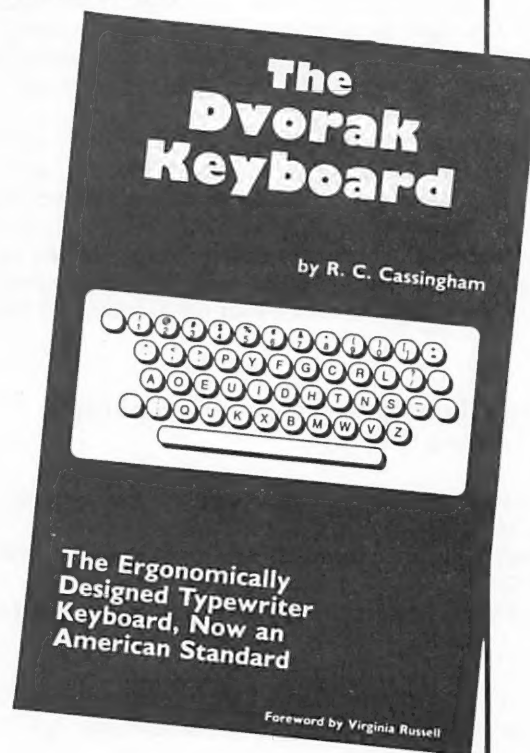
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Product Overviews

Product overviews are detailed descriptions of Dvorak-related products. The regular 'for sale' version of the product is tested, then described in full so that readers can make intelligent choices on what products fit their needs. Opinions expressed in the overview are those of the author.

MacQwerty: Dvorak on the Macintosh

Reviewed by Randy Cassingham

Description: Keyboard redefinition software for the Apple Macintosh, \$35, not copy protected.

Supplier: Paragon Courseware, 4954 Sun Valley Road, Del Mar CA 92014, (619) 481-1477.

Machine used for test: 512K Macintosh.

With MacQwerty for the Macintosh, all current models of the Apple computers now have Dvorak capability. While we think Paragon's keyboard program should have been called 'MacDvorak', the program does the job of bringing Dvorak to this powerful business computer.

This is a no-nonsense program. Just position the mouse on the Dvorak icon, tap it twice, and the keyboard is reconfigured. Alternatively, the Dvorak program can be put into the system folder for automatic Dvorak remapping every time the computer is booted up.

We tried MacQwerty with several programs, and it worked flawlessly. Paragon Courseware, though, advises that some modem communications programs take over the keyboard and makes MacQwerty ineffective.

In addition to Dvorak mapping, the program can be used to make any custom layout of the keyboard. That allows, for instance, a one-handed Dvorak layout for handicapped Mac users.

Hooleon Overlays: a Great Companion

Reviewed by Randy Cassingham

Description: Keyboard overlay stickers, available for several types of keyboards; \$26.95 ppd.

Supplier: Hooleon Company, PO Box 201, Cornville AZ 86325, (602) 634-7517.

Machine used for test: Stock keyboard from a Leading Edge Model 'D'.

One often-asked question we hear is, "Once I've converted my computer to Dvorak, how do I make the keys look right?" Luckily, there is a good answer.

Some computers' keyboards have removable keycaps, so all you have to do is pull the caps off and switch them around. But if the keyboard has "sculptured" keys that can't be moved, or if the computer is to be shared with a Qwerty typist, moving the caps around may not be an ideal solution.

Enter Hooleon Company's keyboard overlays. When we first heard the term "overlays" we weren't sure what they would be. They are simply plastic tabs that stick on top of the keys that have Dvorak letters in bright red type and Qwerty letters in smaller black type. They cover the tops of the keys completely, giving you the proper layout on the keyboard, and they make a great companion to software you can use to convert the computer to Dvorak.

They are better than just making your own stickers with paper labels, and here's why: they have the same look and feel as your old



keycaps, so they look like they belong there. The letters are big and clear, and printed on the underside so they can't wear off. The overlays have the same textured feel the keys had before, so they have no effect on typist comfort. They are easy to apply and stick well, but will come off if you need them to.

If you have to share your computer with Qwerty typists, they don't have to type blind. The Qwerty key legends, though smaller, are quite readable and allow the Qwerty typist to hunt-and-peck.

The Hooleon overlays are a fine solution to the problem of sculptured keys, and they would probably be good for use with typewriters, too. They're available to fit the size and color of several kinds of keyboards.

Borland's Superkey: a Bomb

Reviewed by Randy Cassingham

Description: Keyboard macro/redefinition software for the IBM and compatibles, \$69.95 ppd, not copy protected.

Supplier: Borland International, 4585 Scotts Valley Drive, Scotts Valley CA 95066, (800) 255-8008 (in Calif: (800) 742-1133).

Machine used for test: Leading Edge Model 'D'.

The policy at *Dvorak Developments* regarding product overviews is to describe products as they relate to the Dvorak keyboard. SuperKey, a keyboard macro program for the IBM PC, definitely has a number of features that are similar or better than other key-

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board macro programs. For instance, it has a data encryption capability that is so good the U.S. Department of State has prohibited Borland from exporting the program out of North America. But when it comes to the Dvorak keyboard, stay away from SuperKey.

Although the Dvorak is not mentioned in SuperKey's 208 page manual, a "DVORAK.LAY" layout file is included on the program disk. But that layout is wrong: it creates the Smith-Corona 'ASK'

'If you bought it already, take Borland up on their 60 day return policy.'

layout, not the ANSI standard Dvorak layout (this can be fixed, though, with the included layout utility program).

But getting the program to install the layout on your keyboard is a chore. You must start SuperKey, then call up its main menu, choose the 'Layout' option, tell it you want to load a new layout, type in the name of the file that holds the layout definition (using Qwerty, because you don't have a Dvorak keyboard yet), then 'Escape' out of the menu structure. Now you have a Dvorak layout, and can go on with your work.

Because of this rigmarole, you cannot have a Dvorak keyboard installed automatically upon the initial startup of your computer. Combine these problems with the optional keyboard 'click' the program creates (it sounds like you've landed in a video arcade rather than in an office), a relatively high price (\$70, versus \$50 for its close competitor SmartKey), and a memory-hungry structure (it takes away 48K of memory in its minimum configuration, versus 21K for SmartKey), we cannot recommend SuperKey. If you bought it already, take Borland up on their 60 day return policy.

Perfect Conversion: the Maxi-Switch Keyboard

Reviewed by Randy Cassingham

Description: Plug-in replacement Dvorak keyboard for IBM PC/XT/AT and compatibles, \$150.

Supplier: Maxi-Switch, 9697 East River Road, Minneapolis MN 55433, (612) 755-7660.

Machine used for test: Leading Edge Model 'D'.

Some programs for MS-DOS (IBM and compatible) computers "take over" the keyboard, and thus don't allow keyboard reconfiguration programs to work. Programs such as Microsoft Word and the Leading Edge word processor are examples of such software; they render programs such as SmartKey ineffective, ruining your Dvorak conversion.

So how do you get Dvorak when you use such unfriendly programs? The Maxi-Switch Dvorak keyboard is one great solution. At \$150 retail, the Maxi-Switch is one of the least expensive replacement keyboards around. But don't let the price fool you — this is one nice keyboard.

Unlike the clacky noisiness of the IBM-brand board or the soft mushiness of other replacements we've tried, the Maxi-Switch has a very comfortable "feel" when you type. And its extra-long cord allows you to get away from the computer console a ways, if you like.

Unexpectedly for such an affordable replacement keyboard, there are some extras. Small but clear lights in the upper right corner notify the typist if the 'caps lock' key has been depressed, if the 'scroll' is locked, and, one of the biggest mysteries on an IBM-type machine, whether the 'num lock' key is down (num lock alternates the number pad between numbers and cursor movement keys).

Another extra includes the ability to move the 'escape' key to either of two positions: to the left of the number row or above the

'home' key on the cursor keypad. Depending on the software you use, this could be a highly useful feature.

Finally, the same keyboard works both on the IBM PC/XT type of machine or on the newer AT computers. The AT has an extra key that the PC keyboard doesn't have (if you're using the Maxi-Switch on a PC, the extra key doesn't do anything, but it's necessary if you have an AT). This ability to work on both machines

'Don't let the price fool you — this is one nice keyboard.'

means you don't have to buy another keyboard if you upgrade to a bigger computer. We don't know of any other keyboards that have this money saving ability. (Switching the keyboard to work with the PC or AT is easy — a small 'DIP' switch on the bottom makes the selection. The position of the escape key is selected the same way.)

We found the Maxi-Switch keyboard to be an excellent value, a good conversion solution, and a comfortable board to type on. It is a great solution to software compatibility problems, and the low price makes it a serious competitor to software conversion.

Coming Product Overviews

We have received review copies of the following Dvorak-related products. Look for detailed descriptions in future issues of *Dvorak Developments*:

- *SureStroke* (keyboard conversion/tutorial package for the IBM)
- *Keyboard Master* (tutorial software)
- *Command Writer* (word processor for the IBM with a self-contained conversion utility)
- *Q-Vert* (tutorial for the Commodore-64)
- *XtraKey* (conversion program for CP/M-based computers)
- *Wiztype* (tutorial program)
- *SmartKey* (conversion program.)

dvorak

The Dvorak International Federation is an organization whose purpose is to promote the Dvorak Keyboard. DIF prides itself in knowing "all there is to know" about the Dvorak Keyboard. Requests for information are addressed immediately. DIF works with computer manufacturers, corporations, companies and individuals helping them to implement the Dvorak Keyboard. Information provided includes:

- Availability on computers with the Dvorak arrangement.
- Software and hardware conversion,
- Training suggestions both for organizations and individuals,
- Where to find typewriters,
- Who is using the keyboard,
- Where to find written materials on the keyboard.

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Membership is \$30.00 per year. Mail form to:
Dvorak International Federation, Box 128, Brandon VT 05733

Keyboard Cadet: a fun Tutorial

Reviewed by Bob Nelson

Description: Keyboard tutorial software for IBM and compatibles, Commodore, Apple and Amiga computers, \$39.95.

Supplier: Mindscape Inc., 3444 Dundee Road, Northbrook IL 60062, (312) 480-7667.

Machine used for test: Apple IIc with monochrome monitor.

Keyboard Cadet is a software package that trains you to touch type using either the Qwerty or Dvorak keyboards. KC sticks to standard typing methods for teaching the user proper hand positioning and keyboard layout, but makes the process of learning to touch type more interesting by incorporating animated graphics.

KC is broken up into 15 sequential lessons. Lessons 1-12 introduce new keys and reinforce already-taught keys before moving on to two-letter combinations and words. There are three different speeds you can choose when practicing these lessons. Lesson 13 gives you practice typing words, Lesson 14 allows you to type sentences, and Lesson 15 tests your typing ability on paragraphs, then calculates your words-per-minute rate.

What makes KC particularly interesting is its use of animated graphics to make the learning process more stimulating. In each of

'KC is easy and enjoyable to use.'

the lessons 1-12, you are put at the help of a spaceship looking out the cockpit window into outer space, where words appear and disappear. The challenge is to make the letters explode by typing them on the keyboard. A diagram of the keyboard and correct hand positions are shown on the screen at all times to help you learn correct finger reaches and to type without looking at the computer keyboard. If you fail to successfully complete a lesson, the program will repeat that lesson until you master it.

I found KC easy and enjoyable to use, though it does have an irritating defect: the layout the program uses for the Dvorak keyboard. The quote/apostrophe, colon/semicolon, and question mark/backslash keys are not in their ANSI standard Dvorak positions, but rather in the older 'ASK' version of the Dvorak. This seems especially odd in light of the fact that the manual shows a drawing of the Dvorak with all of the keys in their standard positions. Perhaps this is a quirk in the Apple review copy I tested and Mindscape plans to correct the problem in future releases.

KC is also available for Commodore and IBM compatible computers. Other than the keyboard layout problem, I find Keyboard Cadet a good tutorial for learning the Dvorak.

Dvorak Book Published

The Dvorak Keyboard, the new book by *Dvorak Developments* editor Randy Cassingham, is finally off the press. The first reviews have come in, and the response so far has been very good.

The book was delayed for several weeks while additional material was added. But all back orders have been sent out and shipping is now on a same-day schedule.

Already, the book has been ordered by several libraries, large companies, schools, and many individuals.

Randy looks forward to hearing from the early buyers of the book. Comments should be sent to him at *Dvorak Developments*.

Product Alerts

Belmont Adams, 4 Park Avenue, Scarborough ME 04074, advises he has several copies of *Typewriting Behavior* for sale. This is the 1936 book by Dvorak and Dealey that discusses in detail the "science of typewriting" and was the major introduction of the Simplified Keyboard to the public. (We got our copy from him, and it is in mint condition.) Adams also stocks two booklets with informational essays about the keyboard, several new Dvorak typewriters made by Smith Corona, and several other Dvorak-related items. Write for a price list.

Command Software, 1360 North Main Street Suite 1, Walnut Creek CA 94596, (415) 944-9434 has introduced a new word processor for the IBM and compatible computers. 'CommandWriter' can switch the keyboard to Dvorak by implementing a command or the user can specify the Dvorak layout as the default keyboard. It retails for \$150.

The Covington Group, who published the 'Keyer' program for the TRS-80 laptop computer that converts it to Dvorak, has not answered inquiries from *Dvorak Developments*. Readers have reported that Covington has apparently discontinued distribution of the program. We are attempting to find another way to get the program distributed or find another program to convert these and similar laptops to Dvorak.

KEA Systems, 2150 West Broadway Suite 412, Vancouver BC Canada, V6K 4L9 publishes 'ZSTEMpc-4014' and 'ZSTEMpc-VT100'. These software packages are specialized communications programs for computers to 'emulate' certain types of computer terminals. The programs can make the computer's keyboard operate using the Dvorak layout.

Morton Communications Systems International has moved. The publisher of the multimedia classroom training package for the Dvorak can now be reached at: 223 Quail Run Road, Roswell GA 30076.

Palantir Software, 12777 Jones Road Suite 100, Houston TX 77070, (800) 368-3797 offers MacType, a typing tutorial for the Apple Macintosh computer. MacType can keep track of over 100 students training with the Dvorak or Qwerty keyboards. It retails for \$49.95.

The Switch to Dvorak company, who markets a Dvorak conversion system for the Apple IIe, has moved. Their new address is PO Box 162, Cape Canaveral FL 32920. The new phone: (305) 784-1541.

Upstart Publishing, PO Box 22022, Greensboro NC 27420 (919) 379-9732 offers "/SPEEDPACK/", an enhancement program for the popular SpeedScript word processor that runs on the Commodore 64 and 128 computers. It allows the user to toggle between Qwerty and Dvorak and has several other options. It sells for \$15.

MacQwerty - \$35

Keyboard Reconfiguration Program

For the Macintosh

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Continued from page 1

fluence the final "abstract" number when measuring finger travel. Those factors include:

- Whether or not the typists' fingers travel straight from key to key, or go back to their home row positions first. If the former is assumed, the Qwerty figure raises significantly since most typing on the Qwerty keyboard is away from the home row.
- Whether or not the typist moves his entire hand when moving from key to key, or moves just by stretching his fingers.
- Whether the measurements are made on a manual typewriter or an electronic one (finger travel is much greater on a manual machine because of the increased vertical motion).
- The size of the typist's hands plays an important role.

Yamada also points out that it is very difficult to get accurate measurements. Many researchers get their data from computer simulations and often make large statistical errors. In a clinical setting,

'No conclusion as to finger travel can be made until more variables are considered.'

researchers have sometimes wired small lights onto expert typists' fingers, made films of the typist working in dimmed light, and made actual measurements on the film. Working this way is not necessarily accurate but more accurate methods, such as using an ultrasonic Doppler electronic measuring device, are cost prohibitive.

DIF president **Virginia Russell** also had some comments about the article. "We are pleased that Olson and Jasinski (the article's authors) have addressed the long-standing argument of which is more efficient, Dvorak or Qwerty," she said. "Their research is good; however, no conclusion as to finger travel can be made until more variables are considered."

"Controlled studies of the Dvorak and Qwerty keyboards are being conducted. We have statisticians and psychologists collecting information on finger travel, and psychological and physiological stress."

So the final word on the relative finger travel between Qwerty and Dvorak is not yet in. The original "12 to 20 mile" figure that everyone quotes is from Dr. Dvorak himself, and careful study of his work must be made to determine his basis for the claim. But no matter what the method used, any reasonably controlled experiment that uses correct statistical methods clearly shows that Dvorak is a more efficient keyboard. The only question that now remains is how much more efficient Dvorak really is. The answer is being worked on, and we'll let you know.

Smithsonian Presentation Set

As reported in the last issue of **Dvorak Developments**, the Smithsonian Institution requested an early model of a Dvorak-equipped typewriter. The presentation will be made on Friday, April 25th, 1986 in Washington D.C.

Lenore Fenton MacClain, a former pupil of **August Dvorak** and a champion Dvorak typist in the 1930s, will present the manual Royal typewriter she used as a student and later as a teacher at the U.S. Air Force (American University) and as demonstration typist for Navy training films.

In addition, the Dvorak International Federation will give the Smithsonian an International brand (now known as IBM) electric typewriter. The international was given to DIF by **Thomas Booz**, a friend and colleague of Dr. Dvorak. A copy of the 1936 book *Typewriting Behavior*, which describes much of the work done by Dr. Dvorak and colleague **Dr. William Dealey** on the science of typewriting, will be presented on behalf of Dr. Dvorak's widow, **Hermione Dvorak**.

Anyone interested in attending the presentation should contact DIF at (802) 247-6020 as soon as possible.

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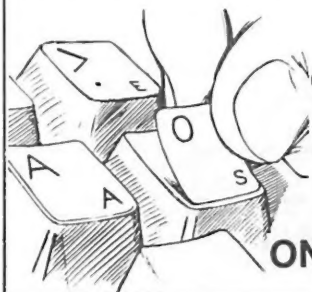
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Bibliographic Notes

- *Government Computer News*, December 6, 1985. Report about the government Dvorak users group who are pushing for conversion by the federal government. "Everyone is philosophically and intellectually committed to it (Dvorak). It's just a matter of time," one Department of Agriculture official was quoted as saying.
- *Data Training*, January 1986. Trend note about government efforts toward conversion.
- *Information Marketing*, January 1986. Short informational article, with a promise by the editor of the newsletter to switch and let readers know how it goes.
- *Byte*, February 1986. Article that explores the efficiency of Dvorak vs Qwerty. See the article in this DvDv about this article.
- *Attorney's Office Management Report*, March 1986. Article noting the trend toward conversion to Dvorak among lawyers who "switch to Dvorak for high-volume keying" to benefit from Dvorak's increased productivity.

Back Issues

• Fall, 1985. Federal Agencies Start Conversion. DIF Proposes Federal Tax Credit. Listings of 23 companies with Dvorak-related products. Background information about DIF. 13 bibliographic entries. 8 pages, \$2.

• Winter, 1985. IRS Action Could Save Millions. Smithsonian Requests Dvorak Typewriter. Listings of 8 companies with Dvorak products. Product overview on Keyer. 4 bibliographic entries. 6 pages, \$2.

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